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INVESTIGATION OF GROUND-WATER CONDITIONS AT THE W.G. KRUMMRICH PLANT MONSANTO COMPANY SAUGET, ILLINOIS

THIRD QUARTERLY REPORT

September 1984

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INVESTIGATION OF GROUND-WATER CONDITIONS
AT THE W.G. KRUMMRICH PLANT
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INTRODUCTION

The findings of the third round of the ground-water sampling program are presented in this report. The purpose of this portion of the study is to determine whether changes in either ground-water flow patterns or ground-water quality have occurred in the six-month period following the collection of samples in November 1983 and February 1984 (see First and Second Quarterly Reports).

Static water-level measurements were made in May, June, and July 1984, and these data are provided in Table 1. Figures 1, 2, and 3 show the configuration of the water table and ground-water flow directions for each round of measurements. Hydrographs for Wells 1, 2, and 3 and the Mississippi River are shown in Figures 4a, 4b, and 4c and provide a continuous record since November 1983. These figures also contain precipitation data for the Lambert - St. Louis International Airport.

Ground-water samples were collected from all 12 monitoring wells during May 7-10, 1984, and a summary of the parameters that were examined are given in Table 2. The analytical data for the May sampling period is summarized and presented in Tables 3 and 4, with February's data (Table 5)

and November's Results (Tables 6 and 7) included for comparison. The distribution of various constituents in the ground water are presented in Figures 5 through 9.

GROUND-WATER MOVEMENT

The water-table configuration in the study area is shown on Figures 1, 2, and 3, with water-level data given in Table 1. These figures illustrate that the direction of lateral flow and the shape of ground-water mound beneath the plant process area that were depicted in the first and second quarterly reports are either absent or masked by a high water table. Water levels have remained relatively constant for the May through July 1984 monitoring periods with a range in elevation of only 1 to 2 feet among the 12 wells.

Figure 1 illustrates a fairly flat water table with ground-water movement towards the south for the first time since the monitoring program began. This change in flow direction may be due to Cerro Copper's fire protection well (No. 6) which operates continuously at 100-200 gallons per minute (gpm) and possibly their well for process water (No. 5) which pumps 150 gpm on selected days of the month. If one or both these wells were operating when water levels were measured, given a relatively flat water table, the flow directions illustrated in Figure 1 are possible. However, Midwest Rubber has three wells (about 110 feet deep) which pump approximately 500,000 gallons per day (gpd) or 347 gpm. This volume of pumpage may be enough to direct ground-water flow to the south.

It is also possible that the higher river stage (408.98 feet above mean sea level) on May 8, 1984 has actually reversed ground-water flow in the ground-water system. The river stage elevation (U.S. Corps of Engineers depot) is more than 5 feet higher than the water-level elevation in Well 3.

Figure 2 demonstates a change in ground-water flow along the west side of the plant property. It appears that the cause of ground-water movement to the south (Figure 1) has ceased or has been masked by larger ground-water withdrawals, at least for the time period when water levels were determined. The Clayton Chemical well (16 gpm) and the Trade Waste Incineration well (30 gpm) do not pump at a rate sufficient enough to alter ground-water flow directions to the magnitude that is illustrated in Figure 2. Therefore, it appears likely that either one or both of these wells were pumping at significanly larger rates during the time that Monsanto's monitoring wells were measured, or one or more dewatering wells were pumping in connection with construction operations. In either case, the pumping rates must be greater than Cerro Copper's well 6 (100-200 gpm on a continual basis) in order to divert ground-water flow away from Cerro Copper's facilities, provided that Cerro's well(s) are in operation.

In Figure 3 a ground-water contour spacing of one-half foot was required to illustrate flow patterns because the water table is very flat. Ground-water movement across the eastern half of Monsanto's property is towards the Mississippi River, however, in the vicinity of Cerro Copper it appears that some movement is being induced to flow toward Cerro or Midwest Rubber. It is evident that conditions causing ground-water flow toward the Sauget Treatment Plant in Figure 2 have changed at the time represented.

Figures 1, 2 and 3 demonstrate that the seasonal high water table is very flat. As a result, low pumping rates can impact the direction of ground-water flow at this time of year. This is significant because moni-

toring wells that were installed downgradient of known or suspected sources of contamination during the seasonal low water table may not always represent the downgradient direction. Coversely, upgradient well locations may not always reflect upgradient water quality conditions.

Changes in ground-water levels with time are shown in Figures 4a, 4b, and 4c which also contain hydrographs for the Mississippi River at U.S. Army Corps of Engineers Depot in Missouri, about 1/2 mile downriver, and precipitation data for Lambert-St. Louis International Airport. Water-levels continued to increase in all three wells through April 1984, as a result of precipitation and a unusually high water level for the Mississippi River. The hydrographs for each of the three wells illustrate a flattening of the water table for the months of May, June and early July 1984, as the dryer season approaches.

GROUND-WATER QUALITY

The water samples collected from all 12 monitoring wells were analyzed by Envirodyne Engineers, Inc. St. Louis, Missouri, for the U.S. Environmental Protection Agency's (USEPA) list of priority pollutant parameters, total organic carbon (TOC), total organic halogen (TOX), total phenols, and chloride (Table 2). In addition, a field blank, a trip blank, and a laboratory blank were also analyzed for the same parameters. The analytical results are provided in Tables 3 and 4 along with pH, temperature, and specific conductance, which were measured in the field. The organic analyses were performed using gas chromatography/mass spectrometry (GC/MS). The analytical results for both the first and second quarters are presented in Tables 5, 6 and 7 for comparison. The analytical procedures used by Envirodyne Engineers were included in the first quarterly report. The distributions of specific conductance, total organic carbon (TOC), total organic halogenated compounds (TOX), total phenols, and total organic priority pollutant compounds in ground water, are provided in Figures 5 through 9.

Ground-water sampling procedures that were used during the initial program were duplicated for the third quarterly program in all aspects. Blind replicate samples were collected for Wells 3 and 12 and were analyzed for the same parameters as each of the other monitoring wells. Except for benzene in Well 12, the range of replicate results is very good.

Inorganic Constituents and Other Parameters

All parameters examined are relatively consistent with those observed

from the February 1984 sampling period (Table 3, 5 and 6), with a few exceptions. The range of replicate results for Wells 3 and 12 is very good.

Conductivity continued to decline at well 3 (4,000 to 3,500 umhos/cm) and at Well 12 (7,000 to 5,500 umhos/cm), and rose significantly only at Well 6 (1,900 to 2,600 umhos/cm). Total phenols remained relatively constant for most wells as did total organic carbon (TOC). Total organic halogens (TOX) increased at Well 6 (31 to 190 ug/L) and Well 9 (59/55 to 360 ug/L); however, the concentration at Well 9 was not nearly as high at the November analysis (750 ug/L). Chloride increased significantly only at Well 8 (10 to 150 mg/L) and decreased markedly at Well 2 (275 to 169 mg/L) and Well 9 (495/480 to 350 mg/L). Chloride values continued to drop at Well 12 (1,055/1,050 to 835/902 mg/L) and this reduction is most likely the reason for lower specific conductance values at Well 12, as well as at Wells 2 and 9. The continual decrease of both specific conductance and chloride at Well 12 may be in part due to the removal of the temporary salt pile that was located nearby. The chemical results for metals are all below detection limits and they are within federal limits, where they apply.

Overall, the quality of the data for the inorganic and selected constituents in Table 3 is about the same as was determined in the second quarterly report, which confirms the improvement in water quality we observed in the February 1984 results.

Priority Pollutant Organic Compounds

The results for the organic priority pollutant compounds (not analyzed in the second quarterly report) have not changed significantly since their initial analysis for the November 1983 sampling program. Methylene chloride was detected in all 12 well samples, both laboratory blanks and the trip blank, which, as discussed in the second quarterly report, indicates that its presence is probably a laboratory artifact (Table 4). Although, laboratory personnel use methylene chloride to clean glassware prior to a deionized water rinse and baking procedure, they apparently cannot remove it entirely from the glassware. It is also used as an extracting solvent in their laboratory and may cross contaminate from the air. Therefore, its reported presence in well water must be considered suspect, according to Envirodyne personnel.

The distribution of organic compounds, illustrated in Figure 9, shows the total priority pollutant compounds detected at each monitoring well (ug/L) with and without methylene chloride included in the total. By examining the distribution of the constituents it is readily apparent that only Wells 9 and 12 are contaminated with organic compounds. This same conclusion was also presented in the first quarterly report based on the initial sampling results for priority pollutant compounds (Table 7). In addition, specific conductance continues to have its highest values at Wells 9 and 12 and may be useful as an indicator for screening wells for organic contamination.

Blind replicate samples were collected for Wells 3 and 12 and were analyzed for the same parameters as each of the other monitoring wells. Except for benzene in Well 12 (3,263 vs. 4,819), the range of replicate results, especially at low levels is very good. The result for bis (2-ethylhexyl) phthalate at Well 12 (211 ug/L) was not supported by a replicate result of 2 ug/L. Envirodyne personnel believe that all bis(2-ethylhexyl) phthalate and butyl benzyl phthalate results are due to laboratory contamination of the water samples. Therefore, the only representative analyses for organic priority pollutant compounds found in excess of 100 ug/L are benzene (Wells 9 and 12), chlorobenzene (Wells 9 and 12), and 1,2-dichlorobenzene (Well 12).

Respectfully submitted,

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Appendix A

Tables

Table 1. Static Water Levels for Shallow Water-Table Monitoring Wells, Monsanto Company, W.G. Krummrich Plant, Sauget, Illinois.

Well No.	May 8, 1984 Elevation of Measuring Point (feet above mean sea level)	May 8, 1984 Depth to Water (feet below measuring point)	May 8, 1984 Elevation of Water Level (feet above mean sea level)	June 7, 1984 Depth to Water (feet below measuring point)	June 7, 1984 Elevation of Water Level (feet above mean sea level)	July 10, 1984 Depth to Water (feet below measuring point)	July 10, 1984 Elevation of Water Level (feet above mean sea level)
1	413.65[a]	10.01	403.64	9.89	403.76	10.59	403.06
2	417.37	15.46	401.91	15.18	402.19	15.17	402.20
3	410.14 (411.35)[b]	7.49	403.86	9.40	401.95	8.92	402.43
4	406.43	4.21	402.22	4.76	401.67	4.34	402.09
5	414.94	12.58	402.36	13.17	401.77	12.68	402.26
6	414.59	12.42	402.17	12.48	402.11	12.32	402.27
7	414.95	12.49	402.46	12.85	402.10	12.35	402.60
8	418.49	16.53	401.96	16.47	402.02	16.24	402.25
9	414.47	12.22	402.25	12.02	402.45	12.24	402.23
10	412.97	9.79	403.18	9.82	403.15	10.14	402.83
11	412.95	9.90	403.05	9.76	403.19	10.14	402.81
12	416.47	13.29	403.18	13.22	403.25	13.66	402.81
U.S. Engineers Depot River Gauge	379.58	29.4[c]	408.98	21.8[c]	401.38	-[c]	-

a) All elevations are referenced to Bench Mark No. 15 (96.06 feet) at the southeast corner of Third and I Streets and have been converted to the NGVD datum. The elevations were determined to the top of the steel well casings for the 2-inch wells and to the top of the recorder shelter base for the 6-inch wells. The conversions to the W.G. Krummrich datum is 413.50 feet (NGVD) equals 101.00 feet (W.G. Krummrich datum).

b) The elevation of the measuring point was increased to accommodate a new recorder shelter.

c) Measurement is in feet above the measuring point.

Table 2. Summary of the U.S. Environmental Protection Agency's List of Priority Pollutant Parameters and Other Selected Constituents Analyzed by Envirodyne Engineers for Each Ground-Water Sample.

PRIORITY POLLUTANTS

Volatile Organic Compounds

- acrolein
- acrylonitrile
- benzene
- bis(chloromethyl)ether
- bromoform
- carbon tetrachloride
- chlorobenzene
- chlorodibromomethane
- chloroethane
- 2-chloroethylvinyl ether
- chloroform
- dichlorobromomethane
- dichlorodifluoromethane
- 1,1-dichloroethane
- 1,2-dichloroethane
- 1,1-dichloroethylene
- 1,2-dichloropropane
- 1,3-dichloropropylene
- ethylbenzene
- methyl bromide
- methyl chloride
- methylene chloride
- 1,1,2,2-tetrachloroethane
- tetrachloroethylene
- toluene
- 1,2-trans-dichloroethylene
- 1,1,1-trichloroethane
- 1,1,2-trichloroethane
- trichloroethylene
- trichlorofluoromethane
- vinyl chloride

Acid Extractable Organic Compounds

- 2-chlorophenol
- 2,4-dichlorophenol
- 2,4-dimethylphenol
- 4,6-dinitro-o-cresol
- 2,4-dinitrophenol
- 2-ntirophenol
- 4-nitrophenol
- p-chloro-m-cresol
- pentachlorophenol
- phenol
- 2,4,6-trichlorophenol

Base/Neutral Extractable Organic Compounds

- acenaphthene
- acenaphthylene
- anthracene
- benzidine
- benzo(a)anthracene
- benzo(a)pyrene
- 3,4-benzofluoranthene
- benzo(ghi)perylene
- benzo(k)fluoranthene
- bis(2-chloroethoxy)methane
- bis(2-chloroethyl) ether
- bis(2-chloroisopropyl)ether
- bis(2-ethylhexy)phthalate
- diethyl phthalate
- dimethyl phthalate
- di-n-butyl phthalate
- 2,4-dinitrotoluene
- 2,6-dinitrotoluene
- di-n-octyl phthalate
- 1,2-diphenylhydrazine (as azobenzene)
- fluoranthene
- fluorene
- hexachlorobenzene
- hexachlorobutadiene
- hexachlorocyclopentadiene
- hexachloroethane

Table 2. (Continued)

Base/Neutral Extractable Organic Compounds (cont'd.)

4-bromophenyl phenyl ether	indeno(1,2,3-cd)pyrene
butyl benzyl phthalate	isophorone
2-chloronaphthalene	naphthalene
4-chlorophenyl phenyl ether	nitrobenzene
chrysene	N-nitrosodimethylamine
dibenzo(a,h)anthracene	N-nitrosodi-n-propylamine
1,2-dichlorobenzene	N-nitrosodiphenylamine
1,3-dichlorobenzene	phenanthrene
1,4-dichlorobenzene	pyrene
3,3'-dichlorobenzidine	1,2,3-trichlorobenzene

Pesticides

aldrin	deildrin
alpha-BHC	alpha-endosulfan
beta-BHC	beta-endosulfan
gamma-BHC	endosulfan sulfate
delta-BHC	endrin
chlordane	endrin aldehyde
4,4'-DDT	heptachlor
4,4'-DDE	heptachlor epoxide
4,4'-DDD	toxaphene

Metals

antimony	mercury
arsenic	nickel
beryllium	selenium
cadmium	silver
chromium	thallium
lead	zinc

Miscellaneous

Cyanide

OTHER

pH	TOC
specific conductance	TOX
temperature	Cyanide
total phenols	

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Table 3. Summary of Analytical Results (Inorganic Parameters and TOX, TOC, and Total Phenols) for Ground-Water Samples Collected During May 7-10, 1984 from Monitoring Wells, Monsanto Company, W.G. Krummrich Plant, Sauget, Illinois (concentrations are in mg/L, except where noted).

Parameter	USEPA Limits[a]	Well 1	Well 2	Well 3	Rep[b] Well 3	Well 4	Well 5	Well 6
pH (units)	-	7.6	7.3	7.9	7.9	7.1	7.2	7.3
Specific Conductance (umhos/cm)	-	1,000	2.600	900	900	1,050	700	2,600
Temperature (°C)	-	14	15	14	14	14	14	14
Total Phenols	-	0.014	<0.002	0.002	0.002	0.003	0.004	0.009
TOC	-	18	8	6	<5	6	<5	11
TOX (ug/L)	-	14	27	5	10	7	22	190
Cyanide	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	250	48.5	169	11	12	76	12	117
Antimony	-	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Thallium	-	<0.2	<0.2	<0.2	<0.02	<0.2	<0.2	<0.2
Zinc	5.0	0.07	0.52	1.09	1.11	0.03	0.03	0.05

Notes: a) USEPA Drinking Water Standards. All limits are Primary Interim Drinking Water Standards, except the standards for zinc and chloride which are Secondary Drinking Water Standards.
b) Replicate samples for Wells 3 and 12 were collected in the field.

Table 3. (Continued)

Parameter	USEPA Limits[a]	Well 7	Well 8	Well 9	Well 10	Well 11	Well 12	Rep[b] Well 12	Field Blank	Trip Blank
pH (units)	-	7.1	6.8	7.3	7.3	7.3	7.8	7.8	7.0	-[c]
Specific Conductance (umhos/cm)	-	1,300	1,500	3,500	1,700	1,150	5,500	5,500	60	-
Temperature (°C)	-	14	14	16	15	14	16	16	17	-
Total Phenols	-	0.003	0.003	0.003	0.002	<0.002	0.86	0.054	<0.002	0.006
TOC	-	5	16	27	10	10	25	22	6	<5
TOX (ug/L)	-	18	82	360	14	15	4,700	5,500	-[d]	25
Cyanide	-	<0.005	0.099	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-
Chloride	250	15	150	350	36	22	835	902	-	-
Antimony	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
Arsenic	0.05	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Beryllium	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Cadmium	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	-	-
Chromium	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-
Lead	0.05	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Mercury	0.002	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	-
Nickel	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-
Selenium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Silver	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-
Thallium	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-
Zinc	5.0	<0.03	<0.03	0.11	0.09	0.09	0.03	0.03	-	-

Notes: a) USEPA Drinking Water Standards. All limits are Primary Interim Drinking Water Standards, except the standards for zinc and chloride which are Secondary Drinking Water Standards.
b) Replicate samples for Wells 3 and 12 were collected in the field.
c) - Analysis was not performed.
d) Sample jar was broken in laboratory

Table 4. Summary of Analytical Results (Organic Priority Pollutant Compounds) for Ground-Water Samples Collected During May 7-10, 1984 from Monitoring Wells, Monsanto Company, W.G. Krummrich Plant, Sauget, Illinois (concentrations are in ug/L[a]).

Parameters	Well No. 1	2	3	3-Rep[b]	4	5	6	7	8	9	10	11	12	12-Rep[b]	Laboratory Blank	Laboratory Blank	Trip Blank
Volatile Organic Compounds																	
Benzene	<1	<1	<1	-	<1	2	1	-[c]	2	449	<1	-	3,263	4,819	2	<1	-
Chlorobenzene	-	-	-	-	-	-	-	-	-	701	-	-	304	399	-	-	-
Chloroform	-	-	-	<1	<1	-	<1	-	-	2	<1	-	-	-	1	<1	<1
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	-	-	-	-	-	-	-	-	-	3	-	-	17	17	-	-	-
Methylene chloride	32	74	51	53	38	102	451	53	161	22	53	22	23	31	27	14	53
Tetrachloroethylene	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Toluene	1	1	1	2	2	2	2	2	2	2	2	2	17	22	2	2	2
1,2-Trans-dichloro-ethylene	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloro-ethane	-	-	3	-	-	-	7	6	4	4	-	-	-	-	5	-	-
Trichloroethylene	-	3	-	-	-	-	1	-	-	<1	-	-	-	-	2	1	-
Acid Extractable Organic Compounds																	
2-Chlorophenol	-	-	-	-	-	-	-	-	-	58	-	-	29	31	-	-	-
2,4-Dichlorophenol	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-
Phenol	-	-	-	-	-	-	-	-	-	-	-	-	18	15	-	-	-
Base/Neutral Extractable Organic Compounds																	
Bis(2-ethylhexyl) phthalate	-	<1	<1	-	2	<1	5	2	3	3	4	<1	211	2	3	<1	-
Butyl benzyl phthalate	-	-	-	-	-	-	-	-	-	14	-	3	-	-	-	-	-

Table 4. (Continued)

Parameters	Well No. 1	2	3	3-Rep[b]	4	5	6	7	8	9	10	11	12	12-Rep[b]	Laboratory Blank	Laboratory Blank	Trip Blank
Base/Neutral Extractable Organic Compounds (Continued)																	
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	30	-	-	344	364	-	-	-
1,3-Dichloroenzene	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	40	-	-	-	1	-	-	-
Diethyl phthalate	3	2	1	1	1	1	1	2	1	-	1	1	2	2	1	1	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butyl phthalate	2	3	3	2	3	1	2	3	3	2	3	2	3	3	-	2	-
Naphthalene	<1	-	-	-	-	-	-	-	<1	-	-	-	4	4	-	-	-
Nitrobenzene[b]	-	-	-	-	-	-	-	-	1	<1	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Total	38	87	59	58	46	109	470	68	177	1,353	63	30	4,235	5,710	43	20	55
Total excluding methylene chloride:	6	13	8	5	8	7	19	15	16	1,331	10	8	4,212	5,679	16	6	2

Note: a) This data represents only those compounds which were detected. See Table 2 for the entire list of Organic Priority Pollutants that were examined for each ground-water sample.
b) Replicate sample collected in the field.
c) - Not detected

Table 5. Summary of Analytical Results for Ground-Water Samples Collected During February 6-7, 1984 from Monitoring Wells, Monsanto Company, W. G. Krummrich Plant, Sauget, Illinois (concentrations are in mg/L, except where noted).

Well No.	pH (units)	Specific Conductance (umhos/cm)	Temperature (°C)	Total Phenols	Total Organic Carbon	TOX (ug/L)	Chloride
1	8.1	950	14	0.004	24	21	50
2	7.5	2,900	14	<0.002	7	33	275
3	8.2	800	13	0.002	9	12	15
4	7.6	850	14	<0.002	12	19	45
5	7.9	650	14	0.004	16	13	10
6	7.4	1,900	15	0.003	11	31	55
7	7.3	1,400	14	0.003	10	30	35
8	6.7	1,150	14	0.003	16	57	10
9	7.1	4,000	14	0.003	25	59	495
9[a)]	7.1	4,000	14	0.054	24	55	480
10	7.1	2,000	15	<0.002	9	28	15
11	7.2	1,100	13	<0.002	18	33	40
12	7.8	7,000	16	0.86	29	5,200	1,055
12[a)]	7.8	7,000	16	0.11	30	5,100	1,050
Field Blank	7.0	110	10	<0.002	<5	19	35
Trip Blank	-[b)]	-	-	<0.002	<5	9	-
Laboratory Blank	-	-	-	<0.002	<5	9	-

Notes:

a) Replicate samples for Wells 9 and 12 were collected in a large common container and dispensed to each sample bottle.

b) - Analysis was not performed.

Table 6. Summary of Analytical Results (Inorganic Parameters and TOX, TOC, and Total Phenols) for Ground-Water Samples Collected During November 15-17, 1983 from Monitoring Wells, Monsanto Company, W.G. Krummrich Plant, Sauget, Illinois (concentrations are in mg/L, except where noted).

Parameter	USEPA Limits[a]	Well 1	Rep[b] Well 1	Well 2	Rep[b] Well 2	Well 3	Well 4	Well 5	Well 6
pH (units)	-	-	-	-	-	8.5	7.8	7.8	7.5
Specific Conductance (umhos/cm)	-	1,200	1,200	3,000	3,000	2,500	1,050	625	2,000
Temperature (°F)	-	53	53	52	52	54	53	52	53
Total Phenols	-	0.020	0.019	0.007	0.003	0.006	0.004	0.003	0.020
TOC	-	66/ 54.5[c]	22/ 26[c]	120/ 46.5[c]	40/ 48[c]	72	42	36	36
TOX (ug/L)	-	16	20	160	510	540	17	11	110
Cyanide	-	<0.005	-	0.005	-	<0.005	<0.005	<0.005	<0.005
Antimony	-	0.011	-[d]	0.165	-	0.097	0.014	0.009	0.012
Arsenic	0.05	0.017	-	<0.002	-	0.007	<0.002	<0.002	0.007
Beryllium	-	0.023	-	0.019	-	0.027	0.017	0.013	0.012
Cadmium	0.01	<0.01	-	0.030	-	0.020	<0.01	<0.01	0.01
Chromium	0.05	0.411	-	0.048	-	0.051	<0.04	<0.04	<0.04
Lead	0.05	<0.001	-	0.057	-	0.035	<0.001	0.001	0.004
Mercury (ug/L)	2.0	<0.2	-	0.47	-	0.35	<0.2	<0.2	<0.2
Nickel	-	0.08	-	0.18	-	0.09	<0.04	<0.04	0.05
Selenium	0.01	<0.002	-	0.006	-	<0.002	<0.002	<0.002	0.002
Silver	0.05	<0.001	-	0.006	-	0.002	<0.001	<0.001	<0.001
Thallium	-	0.002	-	0.062	-	0.047	0.003	0.004	0.004
Zinc	5.0	0.334	-	3.26	-	6.41	0.014	0.011	0.018

Notes:
a) USEPA Drinking Water Standards. All metals are Primary Interim Drinking Water Standards, except the standard for zinc which is a Secondary Drinking Water Standard.
b) Replicate samples for Wells 1 and 2 were collected in the field. Replicate results for Well 9 were determined by analyzing the same well water twice as an internal check on performance by Envirodyne Engineers, Inc.
c) The first set of results for TOC were three times higher than the replicate values, therefore, Envirodyne repeated the analysis. The corrected results are reported as the second number of each pair of values.
d) - Analysis was not performed.

Table 6. (Continued)

Parameter	USEPA Limits[a]	Well 7	Well 8	Well 9	Rep[b] Well 9	Well 10	Well 11	Well 12	Field Blank	Trip Blank
pH (units)		7.3	6.8	7.0	-	7.0	7.3	7.9	-	-
Specific Conductance (umhos)		1,150	1,200	8,500	8,500	2,100	1,100	30,000	<50	-
Temperature (°F)		53	54	51	-	52	54	53	60	-
Total Phenols		0.003	0.013	0.190	-	<0.002	0.002	0.68	<0.002	<0.002
TOC		28	84	112	130	72	36	118	2	2
TOX (ug/L)		9	150	750	-	13	22	4,700	<5	13
Cyanide		<0.005	0.021	0.016	-	<0.005	<0.005	0.013	-	-
Chloride		-	-	-	-	-	-	5,198	-	-
Antimony		0.010	0.012	0.017	0.017	0.011	0.012	0.131	-	-
Arsenic	0.05	0.002	<0.002	0.003	0.005	<0.002	<0.002	0.024	-	-
Beryllium	-	0.010	0.012	0.013	<0.01	<0.01	<0.01	<0.01	-	-
Cadmium	0.01	0.01	<0.01	0.010	<0.01	<0.01	<0.01	0.03	-	-
Chromium	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	-	-
Lead	0.05	0.001	0.005	0.005	0.005	0.004	0.002	0.015	-	-
Mercury (ug/L)	2.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-
Nickel	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.13	-	-
Selenium	0.01	0.005	<0.002	0.004	0.003	0.003	0.003	0.034	-	-
Silver	0.05	<0.001	0.002	<0.001	<0.001	0.006	<0.001	<0.001	-	-
Thallium	-	0.002	0.003	0.007	0.006	0.004	0.003	0.023	-	-
Zinc	5.0	0.015	0.010	0.030	0.037	0.049	0.019	0.037	-	-

Notes: a) USEPA Drinking Water Standards. All metals are Primary Interim Drinking Water Standards, except the standard for zinc which is a Secondary Drinking Water Standard.

b) Replicate samples for Wells 1 and 2 were collected in the field. Replicate results for Well 9 were determined by analyzing the same well water twice as an internal check on performance by Envirodyne Engineers, Inc.

c) - Analysis was not performed.

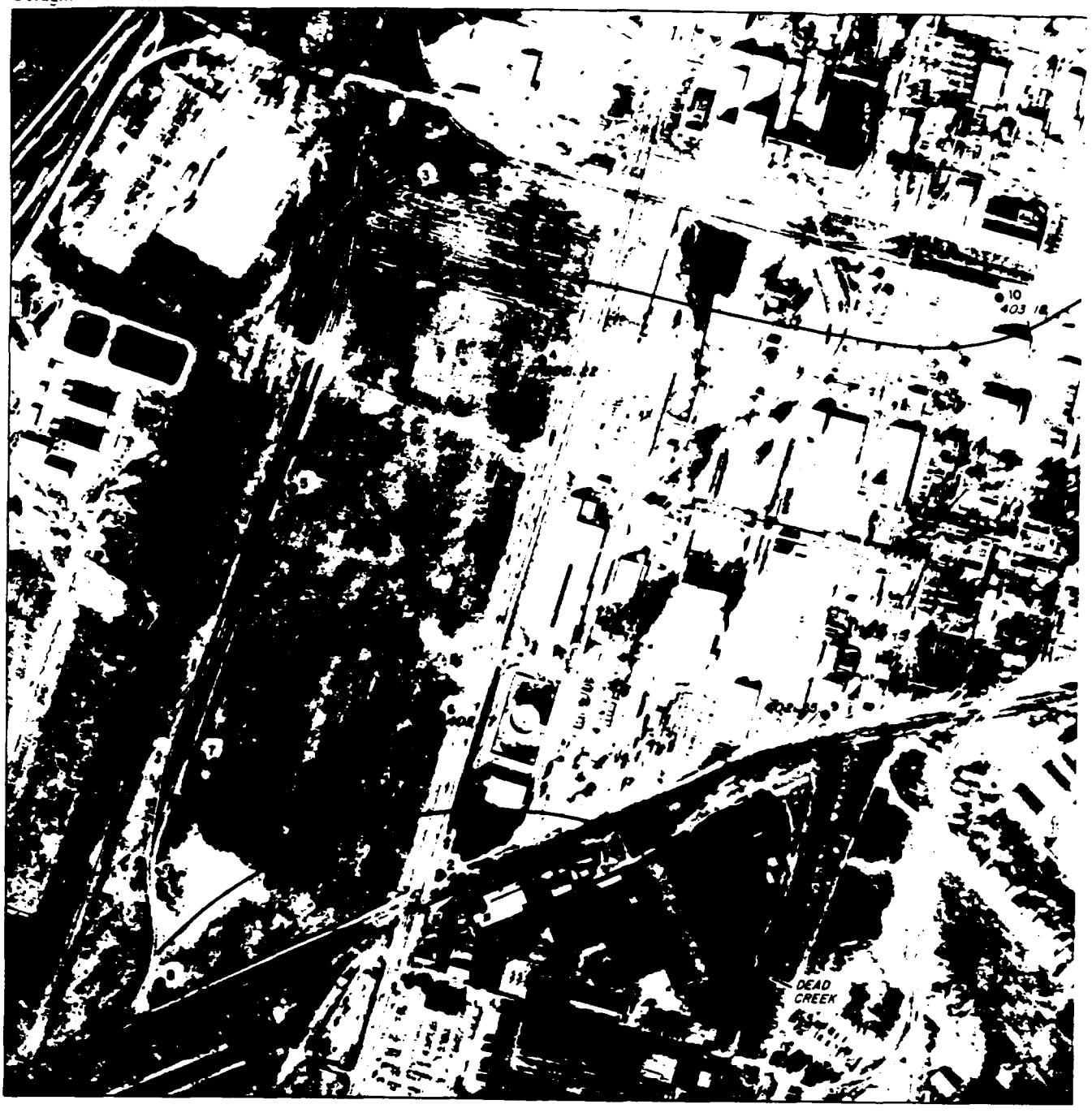
Table 7. Summary of Analytical Results (Organic Priority Pollutant Compounds) for Ground-Water Samples Collected During November 15-17, 1983 from Monitoring Wells, Monsanto Company, W.G. Krummrich Plant, Sauget, Illinois (concentrations are in mg/L, except where noted).

Parameters	Well No. 1	2	3	4	5	6	7	8	9	10	11	12	12-Rep[d]	Laboratory Blank	Blank
Volatile Organic Compounds															
Benzene	-[c]	-	-	-	-	<1	1	3	331	2	<1	425	433	-	-
Chlorobenzene	-	-	-	-	-	-	-	-	1,270	-	-	350	296	-	-
Chloroform	2	28	11	-	1	2	2	1	1	1	1	2	1	1	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	<1	<1	-	-
Ethylbenzene	-	-	-	-	-	-	-	8	-	-	-	-		-	-
Methylene chloride	18	12	12	9	10	18	11	16	10	21	16	49	64	34	26
Tetrachloroethylene	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Toluene	-	-	-	-	2	1	<1	-	2	<1	<1	4	4	-	-
1,2-Trans-dichloroethylene	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-
1,1,1-Trichloroethane	5	-	-	-	-	2	<1	6	3	1	<1	8	7	-	-
Trichloroethylene	6	6	<1	-	-	2	<1	-	<1	-	-	-	-	-	-
Acid Extractable Organic Compounds															
2-Chlorophenol	-	-	-	-	-	-	-	-	55	-	-	182	160	-	-
2,4-Dichlorophenol	-	-	-	-	-	-	-	-	21	-	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-	-	-	-	58	-	-	147	115	-	-
Phenol	<1	<1	-	-	<1	-	-	<1	<1	-	-	40	38	-	-
Base/Neutral Extractable Organic Compounds															
Bis(2-ethylhexyl) phthalate	<1	13	1	<1	<1	<1	1	1	<1	<1	<1	<1	<1	<1	-
Butyl benzyl phthalate	-	-	<1	<1	-	-	-	-	<1	1	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	33	-	-	366	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	38	-	-	-	-	-	-

Table 7. (Continued)

Parameters	Well No. 1	2	3	4	5	6	7	8	9	10	11	12	12-Rep[d]	Laboratory Blank	Blank
Base/Neutral Extractable Organic Compounds (Cont'd)															
Diethyl phthalate	-	-	<1	<1	-	-	<1	-	-	-	-	-	-	<1	-
Dimethyl phthalate	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-
Di-n-butyl phthalate	1	2	2	2	1	2	2	1	1	1	1	2	1	1	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	<1	<1	-	-
Nitrobenzene	-	-	-	-	-	-	-	8	-	-	-	-		-	-
Phenanthrene[b]	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-
Total	32	61	26	11	14	57	15	43	1,828	26	22	1,595	1,500	35	27

Note: a) This data represents only those compounds which were detected. See Table 3 for the entire list of Organic Priority Pollutants that was examined for each ground-water sample.
b) Phenanthrene coelutes with anthracene; therefore, the peak area is calculated as one compound.
c) - Not detected
d) Replicate results for Well 12 were determined by analyzing the same well water twice as an internal check on performance by Envirodyne.



EXPLANATION

3 — MONITORING WELL LOCATION AND DESIGNATION

403.64 — WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL

403.0 — LINE OF EQUAL WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL

DIRECTION OF THE HORIZONTAL COMPONENT OF GROUND-WATER

0 200 400 FT

CONFIGURATION OF THE WATER TABLE ON MAY 8, 1984

MONSANTO COMPANY
W G KRUMMRICH PLANT
Sauget, Illinois

THIRD QUARTER

Figure 1

CONFIDENTIAL 92-CV-204-WDS

CER 093649

EXPLANATION

3 — MONITORING WELL LOCATION AND DESIGNATION

403.76 — WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL

403.0 — LINE OF EQUAL WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL

DIRECTION OF THE HORIZONTAL COMPONENT OF GROUND-WATER

0 200 400 FT

CONFIGURATION
OF THE WATER TABLE
ON JUNE 7, 1984

MONSANTO COMPANY
W.G. KRUMMRICH PLANT
Sauget, Illinois

THIRD QUARTER

Figure 2

CONFIDENTIAL 92-CV-204-WDS

CER 093651

EPA/CERRO COPPER/EIL/PCB ATTORNEY WORK PRODUCT / ATTORNEY CLIENT PRIVILEGE

Geraghty & Miller, Inc

CONFIDENTIAL 92-CV-204-WDS

CER 093652

EXPLANATION

3 — MONITORING WELL LOCATION AND DESIGNATION

403.06 — WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL

403.0 — LINE OF EQUAL WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL

← DIRECTION OF THE HORIZONTAL COMPONENT OF GROUND-WATER

0 200 400 FT

CONFIGURATION OF THE WATER TABLE ON JULY 10, 1984

MONSANTO COMPANY
W.G. KRUMMRICH PLANT
Sauget, Illinois

THIRD QUARTER

Figure 3

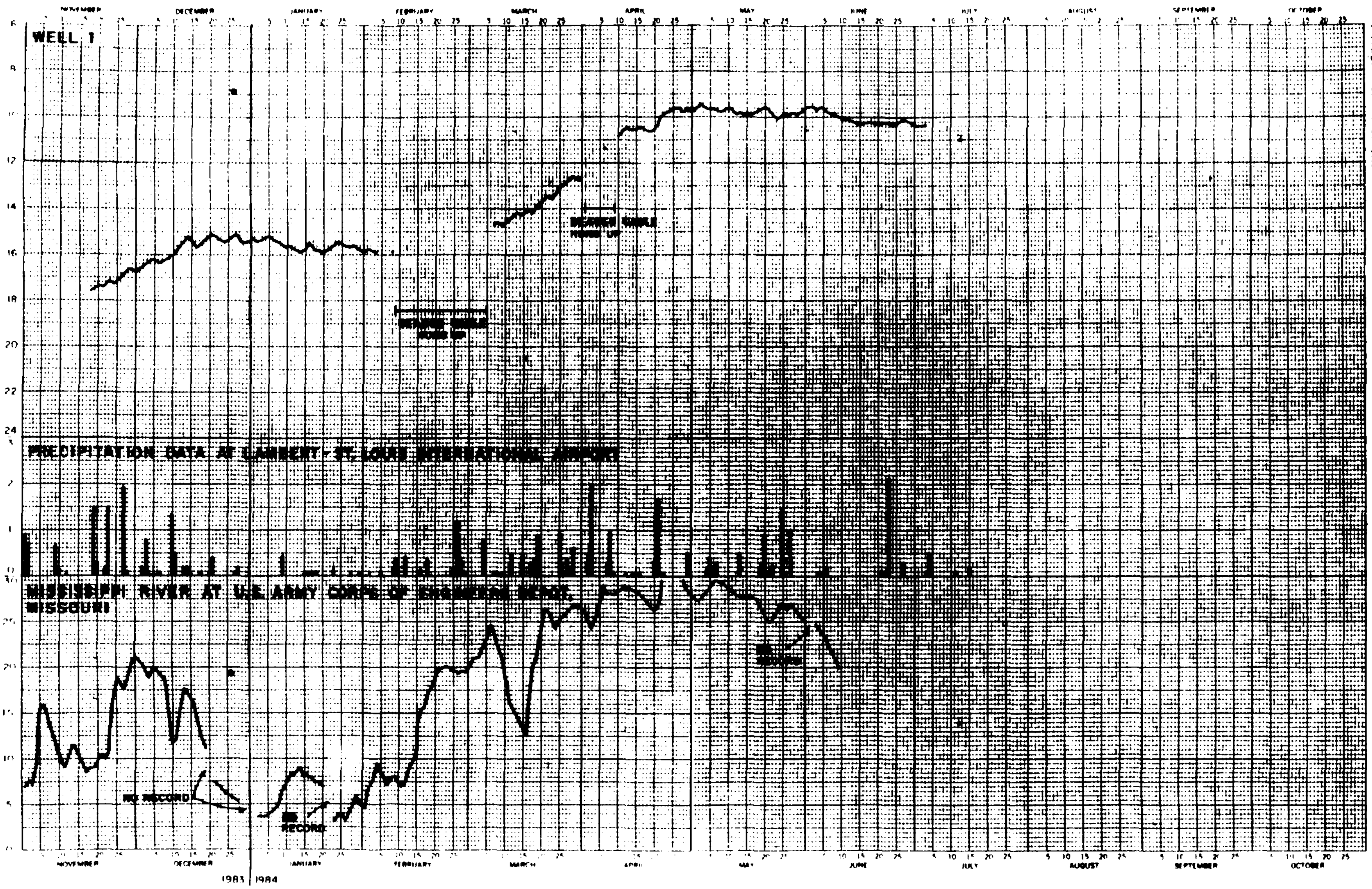


FIGURE 4a - HYDROGRAPHS FOR WELL 1 AND THE MISSISSIPPI RIVER AND PRECIPITATION DATA

MONSANTO COMPANY W.G. KRUMMRICH PLANT SAUGET, ILLINOIS

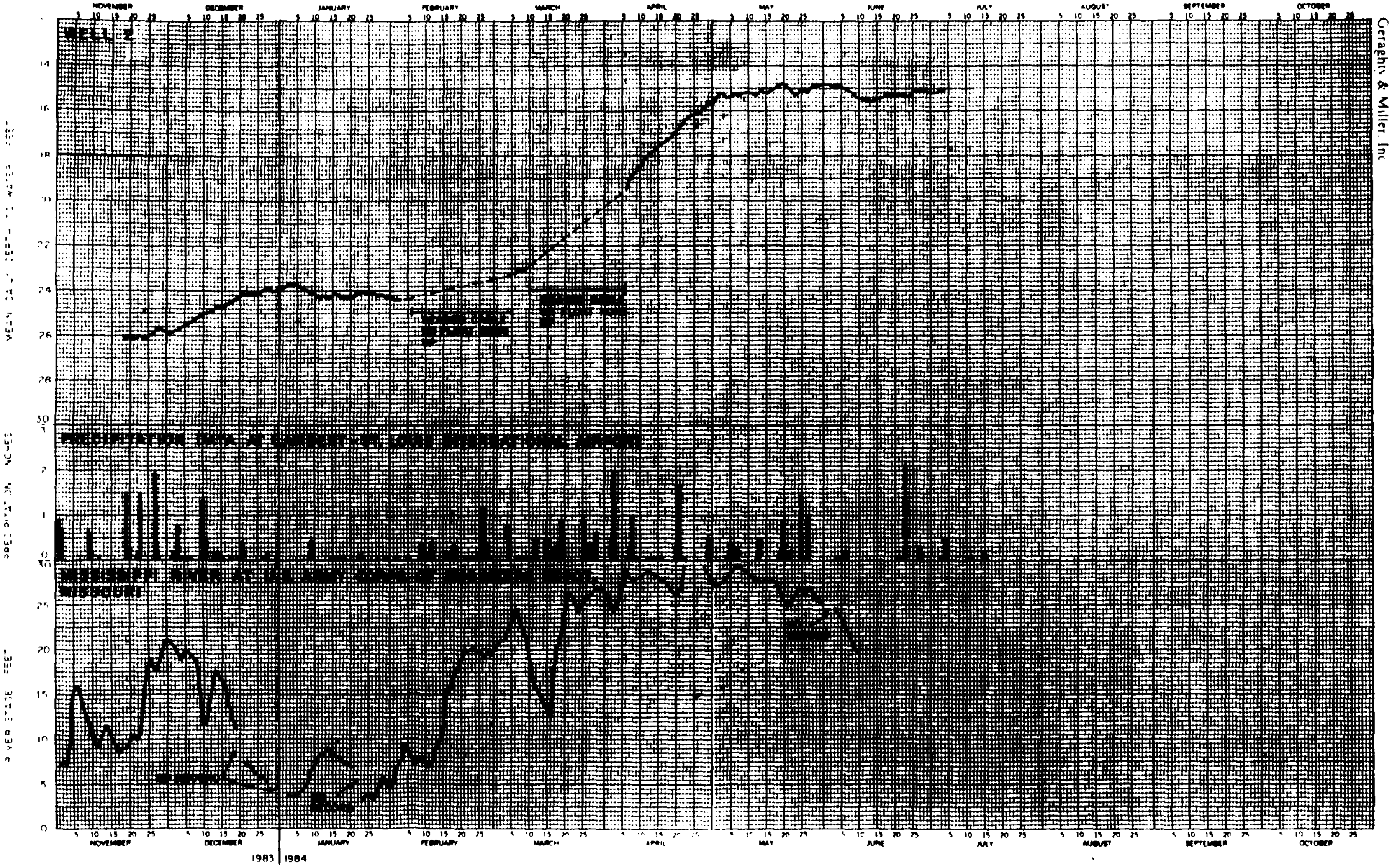


FIGURE 4b - HYDROGRAPHS FOR WELL 2 AND THE MISSISSIPPI RIVER AND PRECIPITATION DATA

KRUMMRICH PLANT SAUGET, ILLINOIS

Geraghty & Miller, Inc.

CONFIDENTIAL 92-CV-[illegible]-WDS

CER 093655

EPA/CERRO COPPER/EIL/PCB ATTORNEY WORK PRODUCT / ATTORNEY CLIENT PRIVILEGE

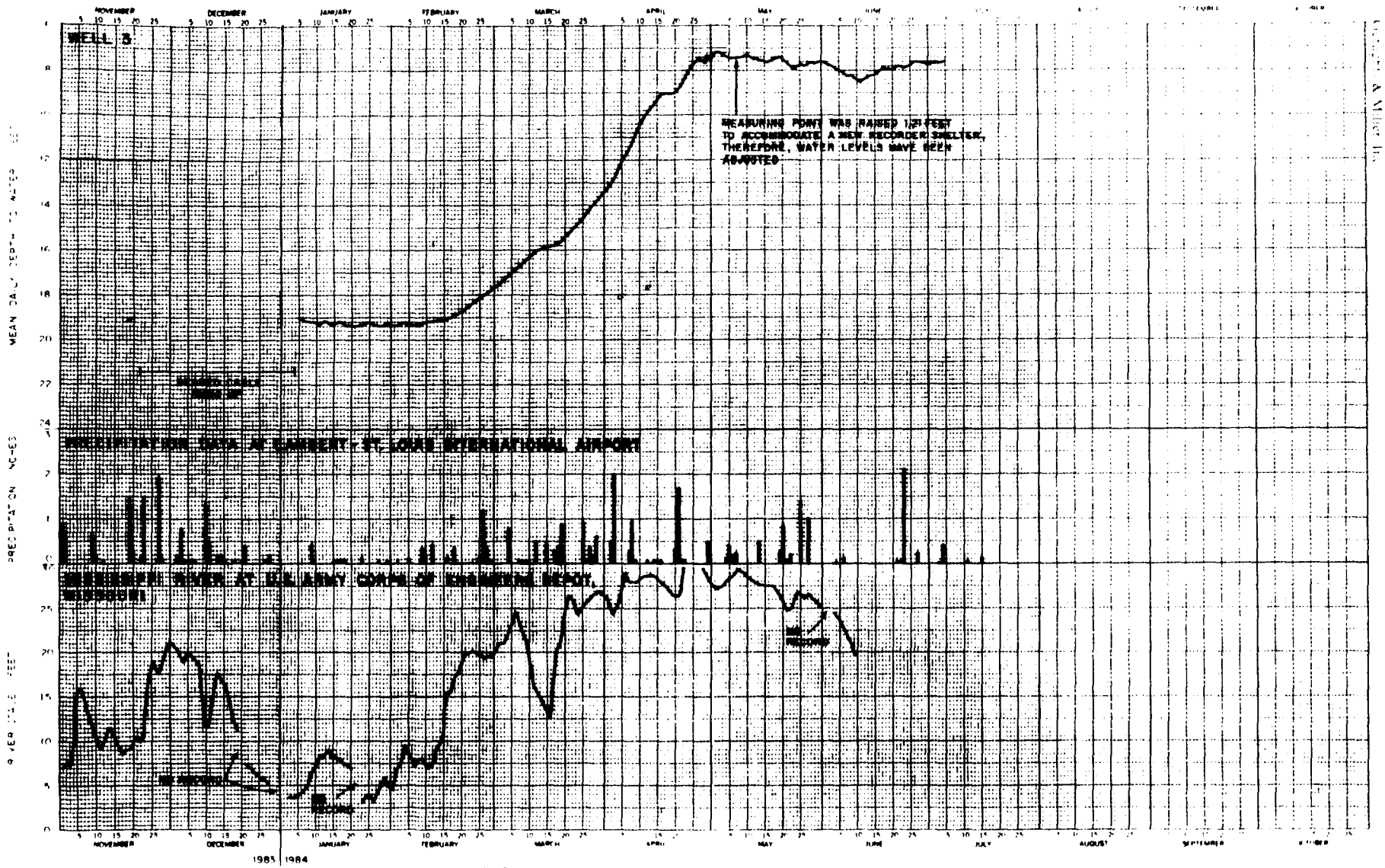
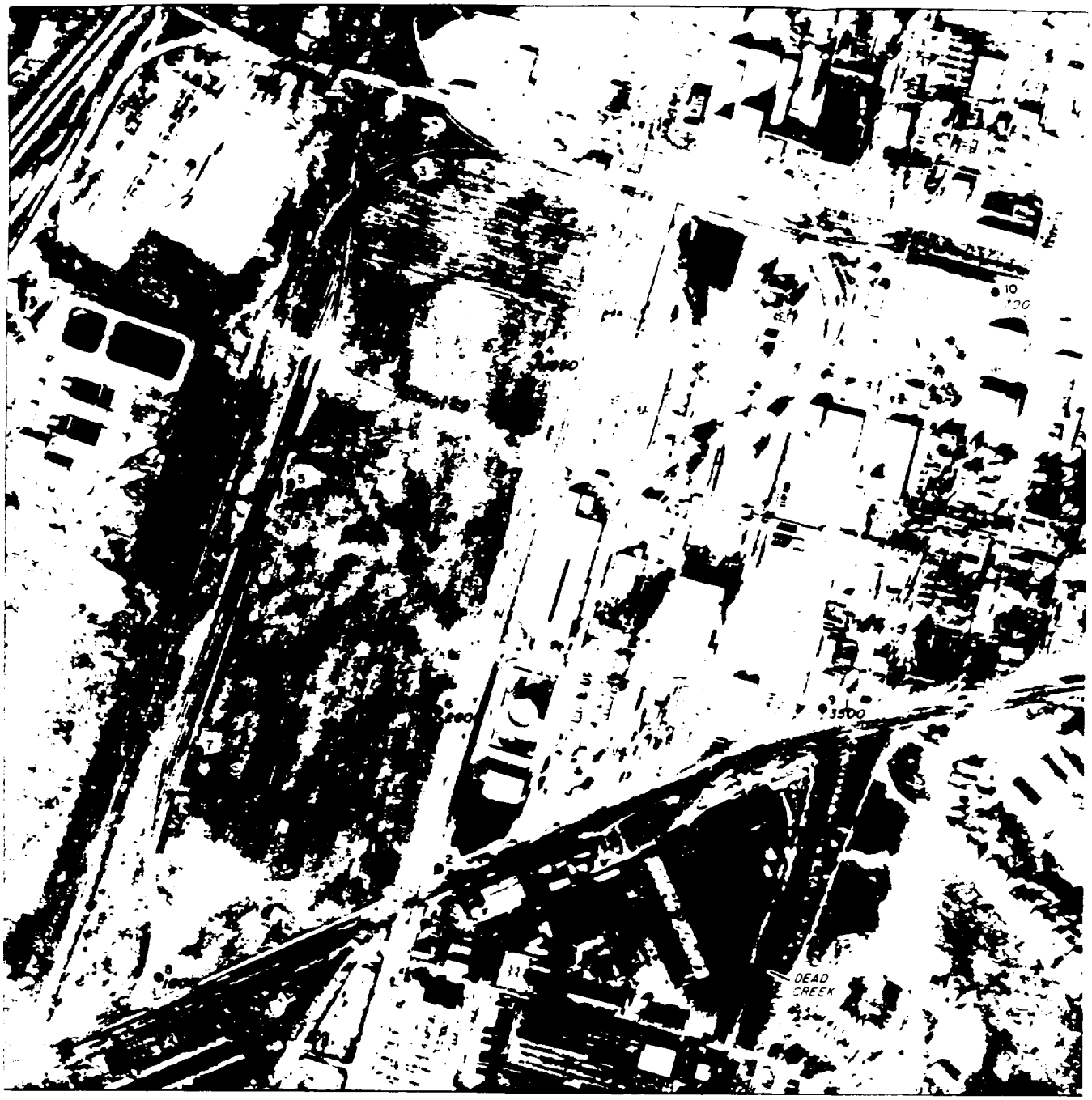


FIGURE 4c - HYDROGRAPHS FOR WELL 3 AND THE MISSISSIPPI RIVER AND PRECIPITATION DATA

MONSANTO COMPANY W.G. KRUMMRICH PLANT SAUGET, ILLINOIS



EXPLANATION

3 MONITORING WELL LOCATION AND DESIGNATION

1000 SPECIFIC CONDUCTANCE ISOCONTOUR

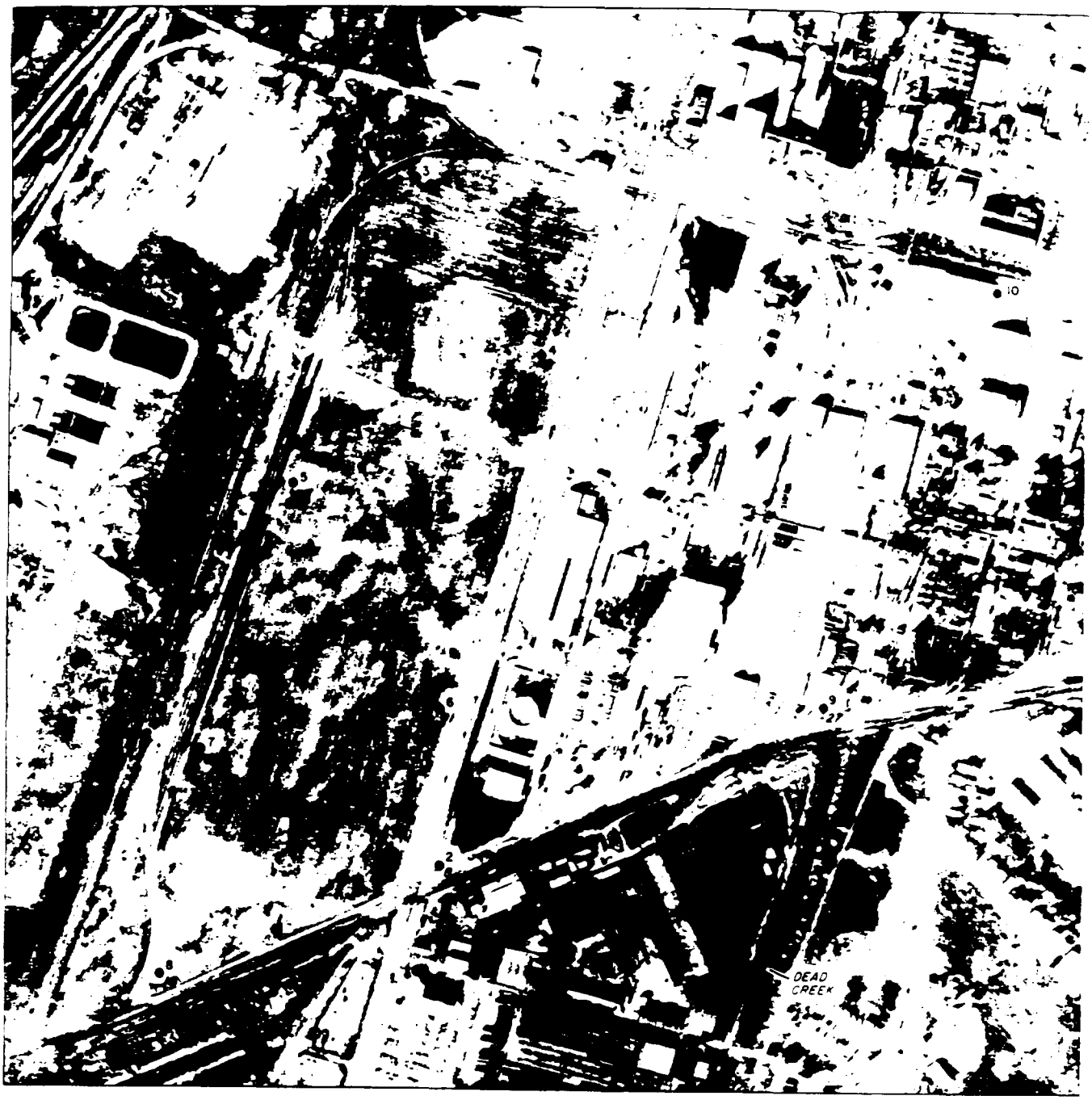
SPECIFIC CONDUCTANCE
OF GROUND WATER

MONSANTO COMPANY
W G KRUMMRICH PLANT

THIRD QUARTER Figure

CONFIDENTIAL 92-CV-204-WC

CER 093658



DISTRIBUTION OF
TOTAL ORGANIC CARBON (TOC)
IN GROUND WATER

MONSANTO COMPANY

THIRD QUARTER

Figure 8

EXPLANATION

3 MONITORING WELL LOCATION AND DESIGNATION

5/ 0 TOTAL ORGANIC HALOGENATED COMPOUNDS (TOx) CONCENTRATION (ppb)
REPLICATE SAMPLE ANALYSIS

DISTRIBUTION OF TOTAL ORGANIC HALOGENATED COMPOUNDS (TOx) IN GROUND WATER

MONSANTO COMPANY

THIRD QUARTER Figure

CONFIDENTIAL 92-CV-204-WC

CER 093662

CONFIDENTIAL 92-CV-204-WD

CER 093663

MONITORING WELL LOCATION AND DESIGNATION

REPLICATE SAMPLE ANALYSIS

0 200 400 FT

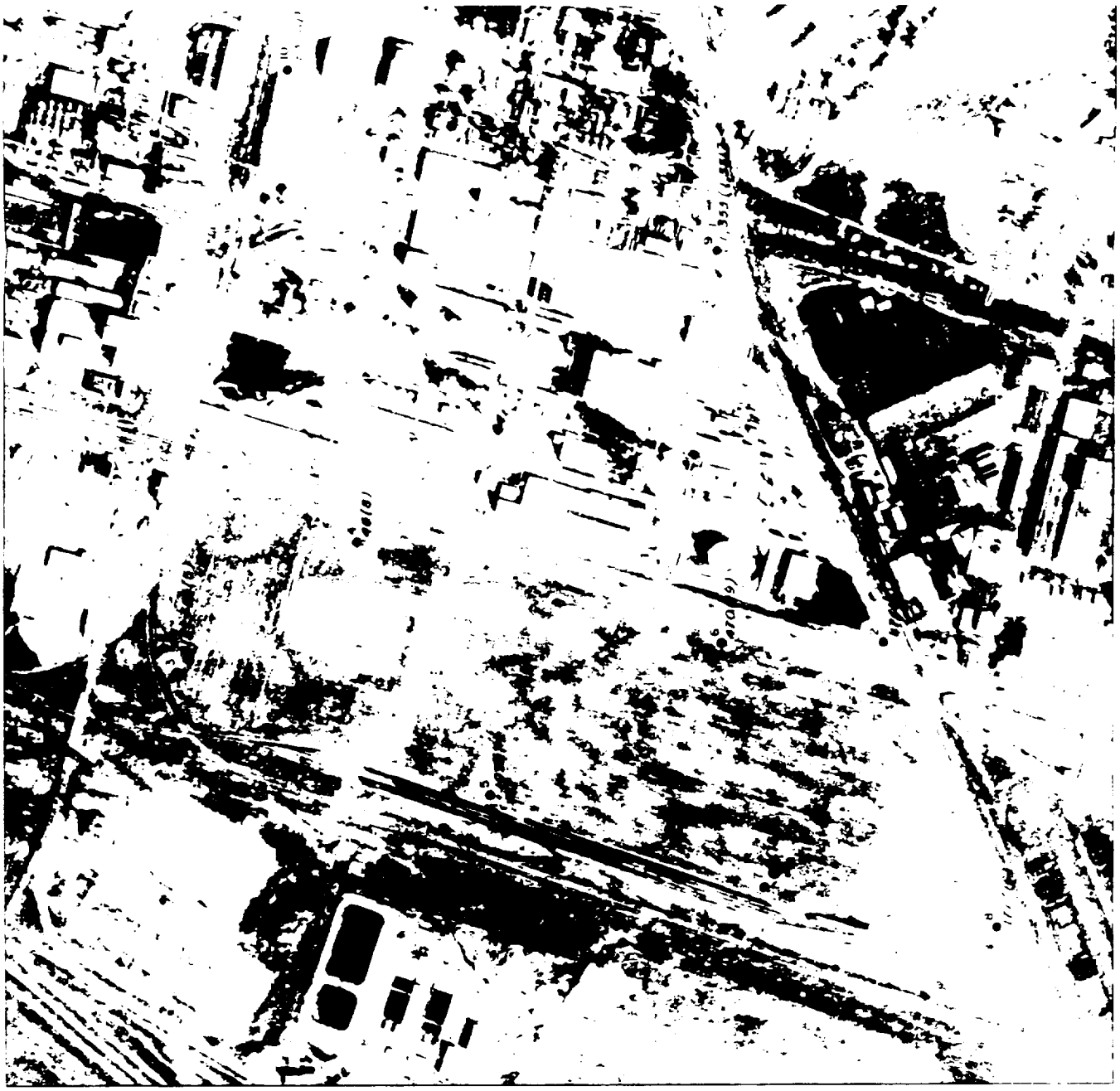
DISTRIBUTION OF TOTAL PHENOLS IN GROUND WATER

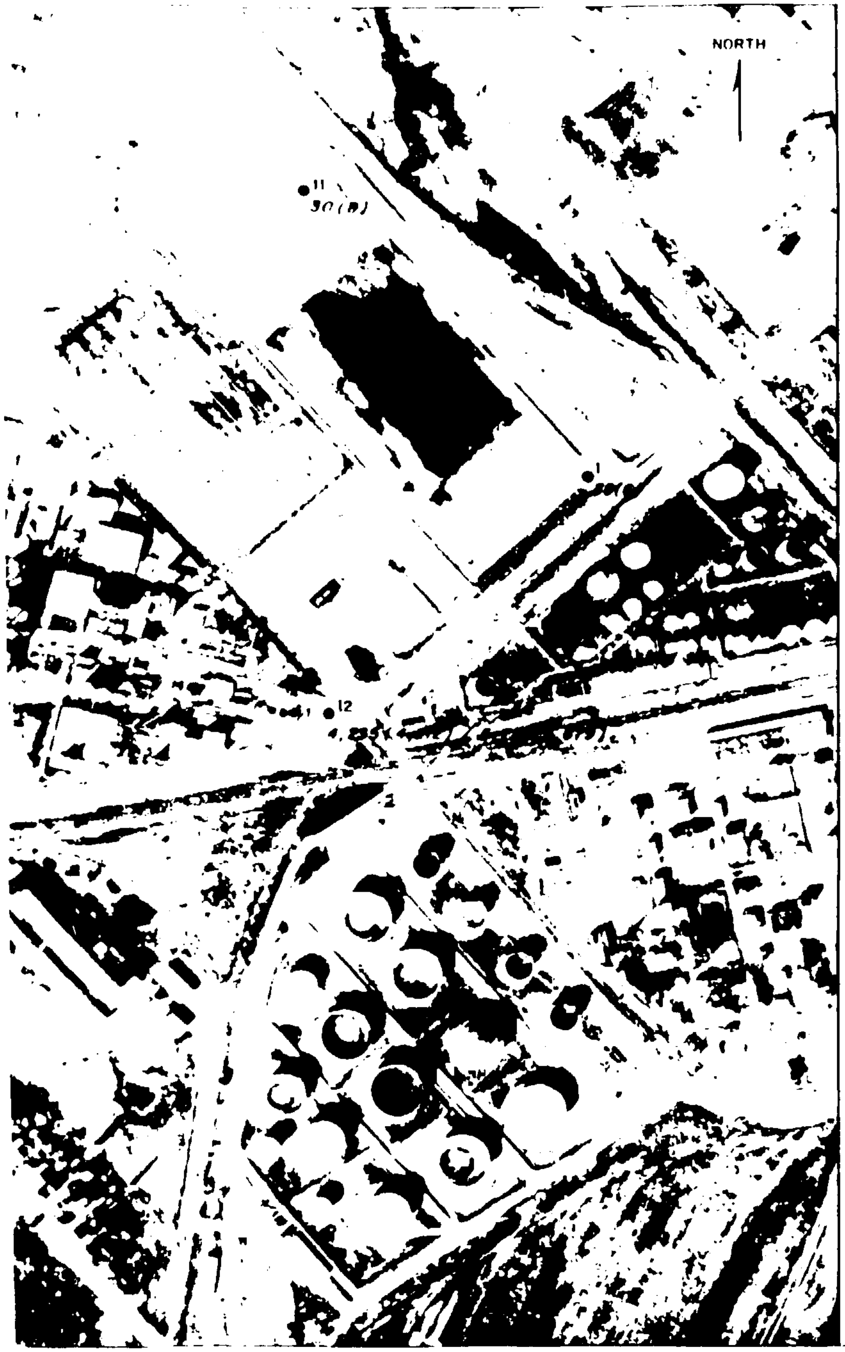
MONSANTO COMPANY

THIRD QUARTER

CONFIDENTIAL 92-CV-204-WI

CER 093664





MONITORING WELL LOCATION AND DESIGNATION

59(8)/58(5)

0 200 400 FT

DISTRIBUTION OF TOTAL ORGANIC PRIORITY POLLUTANT COMPOUNDS IN GROUND WATER

MONSANTO COMPANY

Figure 9

[illegible] ... action

Landfill -

Area 2 [illegible] river

5 sites Monsanto landfill - site R — our responsibility - draft consent orders to do remedial action & enter into good faith negotiations. RIFS 12-18 months; complete [illegible], use existing data

Sauget landfill - site Q

Lagoons & Pit - Site O - willing to organize the PRP's (potential responsible party)

Area 1 - dead creek - A area on Cerro's property; B sector between Queeny avenue & Judas Plain

Cerro - Site I

old landfill Falling spring rd & Queeny

Community Input

State led Cleanup - not a Superfund Site

we will follow Superfund com rel procedures modified by consent decree & whatever modifications are necessary

Com relations - what do we have to do

Fact Sheets

Schedule for press releases

Repository in public place (Village Hall ~~[illegible]~~) - Betty Long Wilson Clerk at Village Hall

Diane to get document for fed Superfund comm relations

Main question - impacting acquatic life in river?

No effect on human health

CER 091389

CONFIDENTIAL 92-CV-204-WDS

EPA/CERRO COPPER/EIL/PCB ATTORNEY WORK PRODUCT / ATTORNEY CLIENT PRIVILEGE

Monsanto

(From: Name, Location, Phone) MAX W. MCCOMBS WGK EXT. 6390

Date: August 2, 1990 cc: B. Boyle

Subj: Sauget Sites PR

Ref:

To: Diane Bartolanzo
Cornell Boggs
Mike Foresman
Steve Krchma
Warren Smull
Steve Smith
[redacted]

The attached appears to be Cerro Copper's required notice of the availability of information on their removal action on Sector A of Dead Creek. It is presented as a proactive communications piece. Also attached is their mailing list. It would be useful for Warren and Diane to compare with ours. We will closely monitor the amount of public interest this generates.

In a related matter, Joe Grana at Cerro tells me that Paul Takacs, Sauget Sites Project Manager for IEPA, has moved a trailer onto Cerro's plant site and plans to be there about "3 days a week" during actual excavation of Sector A.

Max W. McCombs

/sdg
Attachment

CER 091390

CONFIDENTIAL 92-CV-204-WDS

EPA/CERRO COPPER/EIL/PCB ATTORNEY WORK PRODUCT / ATTORNEY CLIENT PRIVILEGE

CERRO COPPER PRODUCTS CO.
P.O. Box 66800
St. Louis, MO 63166-6800
618/337-6000

July 27, 1990

TO ALL INTERESTED PARTIES:

RE: Dead Creek Segment A
Removal Action

On July 5, 1990, Cerro Copper Products Co. ("Cerro") and the Illinois Attorney General, Neil F. Hartigan, jointly announced an agreement on the part of Cerro to remove contaminated sediment from the section of Dead Creek identified as "Creek Segment A" on Cerro's property in Sauget, Illinois. This removal action is scheduled to begin in mid-August, 1990. The agreement between the Illinois IEPA, the Illinois Office of the Attorney General and Cerro is embodied in a Consent Decree entered by the United States District Court for the Southern District of Illinois (Honorable William Stiehl) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act and the Illinois Environmental Protection Act. The Creek Segment A removal project is a step in the overall efforts of the IEPA and the Illinois Attorney General's office to investigate and remediate the Sauget Sites area. In particular, Dead Creek Segment A, is among the specific sites identified by IEPA as part of Area I of the Sauget Sites. IEPA has made it a priority to place Sauget Sites on the National Priorities List (NPL) of sites under the federal Superfund program. Cerro is taking the action required by the Consent Decree with respect to contaminated creek sediments because Dead Creek Segment A is on Cerro's property. As a responsible corporate citizen, Cerro decided to step forward and take the lead on this project, although it is well known and documented that numerous other parties contributed to and are legally responsible for the conditions in Creek Segment A.

In connection with the Creek Segment A removal project, Cerro has stopped all discharges into the 1,600 foot creek segment traversing its property, has constructed an alternative storm water collection and retention system, and is in the process of engaging contractors to perform the actual removal of contaminated sediment from the creek bed and its disposal.

The first part of the removal effort involved a storm water tunnel adjacent to Creek Segment A to empty into a large storage basin on the northern end. The tunnel is ten feet wide by five feet high. The tunnel and basin have the capacity to hold up to 1.5 million gallons of storm water.

The storage basin will pump storm water to the Village of Sauget sewer system at a rate compatible with the waste treatment plant capacity.

The step currently under way is the removal of approximately 20,000 cubic yards of creek sediment from the creek bed. After dewatering, the contaminated sediment will be hauled to a permitted waste landfill outside the State of Illinois. The creek bed will then be backfilled with clean soil.

The portion of Dead Creek which is the subject of the removal action became part of Cerro's property in the 1950s and early 1960s, as the company purchased land on the east side of the creek and added it to its original plant site on the west side of the creek. The south end of Dead Creek is dammed off at Queeny Avenue and the north end for a long time fed the Village of Sauget's sewer system leading to the waste water treatment facilities.

The Illinois EPA has maintained a public information file on the Sauget Sites at the Cahokia Public Library and at the Sauget Village Clerk's Office. Citizens and local officials who wish to know more about the Cerro project are welcome to review the Consent Decree, Site Investigation/Feasibility Study, and the Removal Action Work Plan for Creek Segment A, and other relevant and pertinent documents which are on file at these locations; or they may address inquiries directly to IEPA information officer, Keri Luly, at 217/782-5562, or IEPA Sauget Site Project Manager, Paul Takacs at 217/782-6760, or directly to Paul Tandler, Vice President for Cerro, at 618/337-6000. The IEPA maintains a project mailing list, if you wish to include your name on that list, please contact Keri Luly.

In addition to the foregoing, Cerro welcomes any inquiries and will provide information concerning the removal action upon written request. Please address your written inquiries and requests for information directly to Paul Tandler, Vice President, Cerro Copper Products Co., P.O. Box 66800, St. Louis, Missouri, 63166. If there is

sufficient interest expressed, Cerro will conduct a further public briefing session and site project tour later this summer. Please indicate if you wish to attend such a briefing and tour.

The Illinois EPA, as lead agency, has conducted and intends to conduct further public briefing sessions for the Sauget sites, and specifically for the Creek Segment A removal project. If you are on the mailing list, you will hear later this summer directly from Keri Luly. To supplement the community relations activities of the IEPA, Cerro is publishing a notice of the availability of the public information file, and hereby notifies you that for the next 30 days you are free to make written comments concerning the removal action. Cerro will prepare a written response to significant comments. Both your comments and any Cerro response will be included as part of the public information record.

In the joint announcement made July 5, 1990, by Illinois Attorney General, Neil F. Hartigan and Cerro Copper, I stated: "We hope that Cerro will be an example that environmental responsibility involves more than public relations and token activities. In this case, we knew a number of companies had a role in the unfortunate pollution of Dead Creek but [Cerro] decided that it was time for one company to step up and do something about it." We look forward to your comments, interest and concern.

Very truly yours,

Paul Tandler
Vice President
Cerro Copper Products Co.

POTENTIAL AFFECTED PARTIES

Horace Drake, Plant Manager
Midwest Rubber Reclaiming Co.
3101 Mississippi Avenue
Sauget, IL 62206

Warren Smull
Monsanto Company
800 North Lindbergh Blvd.
St. Louis, MO 63167

Stephen P. Krchma
Monsanto Company
800 North Lindbergh Blvd.
St. Louis, MO 63167

Wiese Planning and Engineering, Inc.
1200 Queeny Avenue
Sauget, IL 62206

Peter Keppler/Steve Mueller
AMAX Zinc Company, Inc.
1626 Cole Blvd.
Golden, CO 80401

AMAX Zinc Company, Inc.
Amax Center
Greenwich, CT 06836

Big River Zinc Corporation
Route 3 and Monsanto Avenue
Sauget, IL 62201

Browning-Ferris Industries
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CER 091394

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CER 091396

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Sauget

Sanitary Development & Research Association

10 MOBILE STREET
SAUGET, ILLINOIS 62201

DISTRIBUTION:

Sauget Sanitary Development & Research Association
Board of Directors

Jack Molloy	Monsanto Company
Dick Bentle	Ethyl Petroleum Additives
Paul Tandler	Cerro Copper Products Company
Bill DeFer	Monsanto Company
Jovencio Bagarinao	Midwest Rubber Company
Paul Sauget	Village of Sauget
Steve Mueller	AMAX Zinc Company
Warren Smull	Monsanto Company
Gene Forneris	Monsanto Company
Bob Murphy	Monsanto Company

Others

Carl Marciante	Sauget P-Chem Plant Manager
George Schillinger	Regional Plant Manager
Harold G. Baker	Village of Sauget Attorney
Steve Smith	Regional Project Manager

Sauget

Sanitary Development & Research Association

10 MOBILE STREET
SAUGET, ILLINOIS 62201

**MINUTES OF THE REGULAR MEETING
OF THE BOARD OF DIRECTORS OF THE
SAUGET SANITARY DEVELOPMENT & RESEARCH ASSOCIATION**

The regular meeting of the Board of Directors was held at the Sauget Village Hall on the eleventh day of September, 1987 at 11:20 a.m.; for the purpose of discussing Physical-Chemical Treatment Plant business and other items. Those directors or alternates in attendance were as follows:

Jack Molloy	Monsanto Company
Sanford Silverstein	Cerro Copper Products Company
Warren Smull	Monsanto Company
Bill DeFer	Monsanto Company
Bob Murphy	Monsanto Company
Dick Bentle	Ethyl Petroleum Additives
Gene Forneris	Monsanto Company
Paul Sauget	Village of Sauget

Also present were Carl Marciante, Sauget P-Chem Plant Manager; Harold G. Baker Jr., Village Attorney and Lino Menconi, AMAX Zinc Company. Jack Molloy called the meeting to order at 11:20 a.m. A motion was made by Sanford Silverstein and seconded by Warren Smull to approve the minutes of the August 7, 1987, P-Chem meeting as written. The motion passed.

I. **Physical Chemical Treatment Plant Operations Report**

Expenses for the period were $219,000 which resulted in a negative variance of $7,400. There were negative variances in the following categories:

Insurance - $30,000 - Property and Workmen's Compensation coverage for the year.

Granular Lime - $17,000 - usage continues to be much higher than budgeted.

Repair & Maintenance - $4,400 - purchase of piping and valves for sludge recirculation line.

Pension - $2,900 - quarterly contribution was paid in the period.

Consulting Service - $2,700 - ground water expenses.

Legal - $2,500 - N.P.D.E.S. permit and Zimpro expenses.

CER 092359

Lime usage for the month was 1655 tons which was 313 tons above the average usage of the last twelve months.

There were three water quality problems in August. Copper was above the limit on August 3rd, Cadmium on August 25th, and Nickel for monthly average.

The Metro East Sanitary District Station was not in operation because the river was below 18 feet. It currently is at 8.3 feet and rising.

The new four paddle flocculator has been installed with nylon sprockets and non-metallic chain. Material has been ordered to replace a three paddle flocculator. An automatic blow out system has been designed and installed for the air lifts in the grit chamber.

Sludge recirculation line construction was begun on August 25th and was put into operation on September 9th.

New lift cables have been installed on the traveling bridge for the South clarifier.

II. Other Business

The sewer investigation is in progress. To date the large collector box, Box E, has been inspected. Line B-E under the TRRA tracks and line H-E, the 30" sewer under the Monsanto siding have been inspected.

Box E appears to be structurally sound and no infiltration was detected. The lining of the box does require moderate rehabilitation. Joints between box E wall tiles are open and numerous tiles in the areas over five feet from the floor have fallen off. From investigations of lines E-B and H-E, it appears that this 1942 vintage box has settled a little.

Line E-B has a four foot plus sag under the TRRA tracks. Numerous broken pipe joints were observed and excessive infiltration is evident. This line appears structurally unsound and irreparable. Box B appears to have also subsided as evidenced by an initial rise in line B-E as it leaves box B.

Line H-E also has a sag but infiltration is minimal. The sag is from about thirty to about sixty feet from Box E. This sag, again, indicates a localized loss of structural integrity. It could, however, be easily replaced. This is a 1932 sewer, box E is 1942 vintage. It appears that the breaks were caused by box E settlement.

To date $22.5k has been paid for investigation and $40k is the total obligated. Installation of a replacement B to E line supported by drilled piers is currently being investigated. If feasible, this method of repair could result in substantial cost savings over the original repair concept.

The Depreciation Account of the 1974 Sewerage Fund has, or will shortly reach the required amount of $1,000,000. Warren Smull made a motion that payments currently being made to the depreciation account continue at current levels through July 1988 to increase the working funds at the P-Chem Plant. Cash flow problems at the plant are now common due to insufficient working capital..

Dick Bentle seconded the motion and it passed.

A motion was made by Warren Smull to approve the 1988 budget for the P-Chem Plant as proposed. After discussion, the motion was seconded by Sanford Silverstein and it passed.

Jack Molloy announced that he was resigning from the Board to accept a transfer within Monsanto, and that Bill Boyle, the new Monsanto plant manager would replace him on the Board of Directors. The Board expressed its gratitude to Jack for ten years of service to the Association as Chairman, and extended best wishes to him in his new Monsanto assignment.

There being no further business a motion to adjourn was made by Jack Molloy and seconded by Bill DeFer. The motion passed and the meeting adjourned at 12:00 p.m.

Respectfully submitted,

W. L. DeFer
Treasurer

WLD/ba